



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

CRITICISMS AND DISCUSSIONS.

NOTES ON CONSCIOUSNESS.

In the following "Notes," whenever I use the word *matter* I use it not as denoting abstract existence or any special mode of concrete existence, but as denoting that objective reality of which we are conscious in experiencing resistance. Let me explain. This reality is not necessarily simple matter. It is energy, whereof the factors, physicists tell us, are matter and motion. Matter may be distinguished from motion as the thing that moves. Motion, on the other hand, may be distinguished from matter as the generic and genesial change that matter undergoes—a change that may be conceived as originating in the immediate contact of the ultimate particles of matter (giving rise to interaction) in the plenum of the universe. If not thus conceived—if motion is assumed to be an intrinsic property of matter—energy and matter, we must admit, are the same thing. In the view here suggested, motion is a material change arising from the law of stress, operating in the universal plenum. Be this as it may, the product of matter into motion, or of matter into itself through motion (the involution of matter), I hold, name it power, force, energy, momentum, what you will, is the fundamental fact of human knowledge, everything else that exists for man being derived from it, and resolvable into it.

I.

When one billiard ball meets another, the balls are, in a sense, conscious of the impact; that is, both undergo changes responsive to it—the only sense, as I conceive, in which consciousness of any degree is intelligible. These simple changes present consciousness in its lower forms; from which it ranges, through interactions of increasing complexity and integration, till it culminates, so far as our narrow ken may reach, in the consciousness of man. Perhaps the most pregnant feature of these changes, as of the changes of consciousness in every other degree, is that they exist exclusively for the subject of them. The changes in neither ball exist for the other ball, or for any other thing (be it particle or organism) in the universe. It is commonly assumed that this exclusiveness is peculiar to psychical phenomena as they appear in man. It belongs in fact not only to recognised psy-

chical phenomena as they appear in man, but to all phenomena without exception—to all action. Strictly, the universe is one expanse of consciousness, continuous as the sea, though discrete like the waves. The pressure received by the table on which my arm is resting exists for the table alone, as truly as the answering resistance exists for me alone. The molecular transformations which the pressure sets up in the table, and which constitute in philosophical exactness a direct knowledge of the pressure, are for the table, and not for me, or anybody else, or anything else; precisely as the molecular transformations which the resistance sets up in my brain, and which constitute a direct knowledge of the resistance, are for me, and not for the table, or anything else, or anybody else. I cannot occupy the table's center of stress, any more than the table can occupy my nerve-center. The principle of identity forbids this: a thing cannot be itself and at the same time something else. Consciousness, throughout its range (from the infinitesimal to the infinite), may be defined as the change which a unit of any order undergoes, to the exclusion of all other units of every order. This definition, if I mistake not, includes the three traits at once essential and peculiar to consciousness: immediacy, subjectivity or interiority, finality—the first expressly, the other two as corollaries from the principle of exclusiveness. It shuts out self-consciousness, as incompatible with all.

* * *

Consciousness, as we know it in ourselves, seems the orderly yet consolidated revival in organic structure of past affections or impressions, by present ones in unison with them; the revived impressions representing the impressions which through eons have wrought the structure, and reacting on the impressions that revive them. In other words, consciousness of this degree is the state wherein the organism, as a whole, becomes responsive to the behavior of its parts, as parts—wherein the structural register of what is common to all the affections of the organism, yielding the concept of self, interacts with the inferior structures yielding concepts of things, percepts, and sense-impressions—wherein awareness (interaction in its simpler forms) is carried up into personality, through an organic unity higher than that of life—wherein the automatism of life rises, through evolution, into the seeming spontaneity of mind.

* * *

All knowledge is immediate knowledge, or reducible to immediate knowledge. Whatever we know immediately we know as existing, seeing that in immediate cognition the action of the object is unaffected, except by the equal reaction of the subject; and we can no more doubt such action—can doubt it even less—than we can doubt our own existence, for the knowledge of our own existence is derived from it. *Nosco ergo sum*. "I know" implies my existence, to be sure, but not my immediate knowledge of it. The knowledge of my existence presupposes the conception of self, which is formed, like every other conception, by the mediate process of abstraction and generalisation: the knowledge is derivative, not intui-

tive. The foundations of knowledge are thus laid as deep and sure as existence itself.

* * *

What other theory of knowledge offers so high a warrant of certainty as the theory that one thing knows another thing by the direct action of that thing upon it, with its own reaction upon that action? To me this exchange of equivalent activities is the principle of knowing, and at the same time of doing—of transformation, development, evolution. Consciousness in one of its aspects is simple actuality, and belongs to everything that exists, in the exact character and measure of the existence. Change, interaction, actuality, consciousness are but different aspects of the same thing. The interaction of things is the intuition of being, and, hence, philosophically, is knowledge, whether involved in elemental obscurity, or expressed directly in terms of developed mind. Consciousness, indeed, is so completely identified with existence, that a distinctive name for it seems hardly necessary or proper, and, in my opinion, has proved actually misleading. A distinctive name for a universal property could scarcely have proved less than misleading, since it implies that what in reality belongs to everything belongs only to things in a special order of combinations. It is said the Greeks had no term for consciousness until the decline of philosophy, and it is perhaps a fit subject of regret that they ever got one, for it is difficult to see what end it has served, except to handicap philosophy, while making its course darker and more slippery than it might otherwise have been. In the morning freshness and sanity of the Greek mind, the relation between the organism and external nature was felt in its simplicity. The refinements and sophistications that have since obscured the relation are the morbid effects of thinking of it above that which is written. Unfortunately, what deities and demons once were to poetry, hypostatized abstractions still are to philosophy. The machinery of the poets has vanished, that of the philosophers lingers, bright with use, if not unimpaired in strength. Is poetry, then, more congenial to truth than philosophy? Or are the illusions of philosophy more subtle and more deeply lodged? However this may be, it behooves us to bear in mind that what we name consciousness is abstracted from existence. Let us take heed how we assign individual substance to this abstraction, pregnant with significance though the concrete is.

* * *

Two things may be equivalent without being the same, except in kind; and such is the relation of consciousness to the components whereof it is the resultant. The equal reaction with which one atom or one infinitesimal answers the action of another appears to me the seminal principle of consciousness, as of all other forms of existence. Out of it grows the phenomenal universe, comprehending mind in its whole line and scope.

II.

Self-consciousness, as described by the psychologists, is a self-contradiction. For what is it that is conscious? Self, say they. And of what is it that self is conscious? Self, again. Self is thus at the same time both subject and object—an absurdity. Self, they explain, is conscious of its own states; that does not mend the matter. A thing not only is indistinguishable from its attributes but consists of them; subtract the sum of its attributes, and nothing remains. Besides, these states, as manifestations of a conscious self by hypothesis, exist only as the constant sequents of that self; whereby, self becomes its own cause, as well as its own object—the absurdity doubled.

* * *

That which happens to people, when they fancy they are self-conscious in the primary sense of the term, is the focusing of consciousness on the organism, as distinguished from the environment, abstracting the subject from the object, and concentrating attention on the former, the concentration being determined, like concentration in other parts of the field of consciousness, by interest, pleasure, excitement, shock, or whatever else, directly or indirectly, may send a wave of stimulation to one ganglionic center rather than to another. It is to be remembered in this relation, furthermore, that consciousness may embrace without confusion a number of objects at once—as many as six or seven, in the opinion of the elder psychologists—probably several more actually, with its potentiality in this respect yet unexhausted. Obviously, this fact affords within the horizon of consciousness a considerable scope for the play of attention—that is, for the concentration of a single consciousness on various points in various degrees. As respects the possible objects of simultaneous attention, consciousness may be focused on one, or extended with different degrees of concentration to several, or distributed faintly among all. This field of consciousness attention, tethered between subject and object though it is, can be made to traverse from one limit to the other, backward or forward (as attention vibrates between the terms of a relation), without justly exposing consciousness at any point to the charge of transcending itself in self-consciousness.

* * *

A subjective fact and an objective fact are not different facts, but the same fact in different points of view,—the same fact withdrawn by abstraction from the subject and the object alternatively; that is to say, every fact of consciousness is a subjective fact or an objective fact, according as consciousness is concentrated on the subject or the object,—as one or the other of these terms in the relation of knowledge dominates the psychic field. As respects self-consciousness, the distinction between this concentration of consciousness on subject or object, and the concentration of consciousness on consciousness is very broad. In the former, consciousness is concentrated by external agency (external to the individual movement

of consciousness) in a particular part of its field; whereas, in the latter, consciousness is assumed to concentrate itself on itself. The one operation involves only a simple distribution of attention, under the law of causation; the other would violate both the law of causation and the law of identity. One is the sea raised into ground-swells by storm or earthquake; the other, the sea without wind or shock raising itself into ground-swells, and precipitating itself upon itself.

* * *

As for self-consciousness, the difficulty is not that consciousness is an ultimate fact (were it so in the fullest sense it would not on that account elude the super-cognition implied in the assumption of self-consciousness), but that it is a fact at all; since no fact can be other than itself, as consciousness would have to be did it react on its own action, thereby becoming self-conscious. The truth is, the difficulty consists in the absence of difficulty. Sheer change, viewed with the existing prepossessions of philosophy, appears naturally an inadequate account or no account of consciousness. Its very simplicity, combined with its immediacy, perplexes observation under such conditions, baffling attention by standing within its guard, so to speak. Yet consciousness, if we consider it well, can have no higher credential to offer; for, though it confronts everything else in its field, it is like the eye powerless to confront itself.

* * *

Self-consciousness and the immateriality of mind are pseudo-conceptions born at the same birth. It is perhaps not easy to say which of these twin illusions first saw the light, but I am disposed to recognise the priority of self-consciousness; which, having as a contradiction no place in reason, must needs be placed in a realm beyond reason, where contradiction is the touchstone of truth rather than of error, and whereof one may say, as Tertullian said of a cherished dogma, "It is certain because it is impossible." Before the date of self-consciousness as a philosophical tenet, the exigencies of philosophy, though giving rise to countless absurdities, had not called for the immateriality of mind, so far as I am aware; but thereat this absurdity became an instant necessity.

* * *

What is called the reflective or philosophical consciousness, and is supposed to be self-consciousness, is a greater complexity, speciality, and range of responsive energy, including a more or less complete independence of the immediate environment, due to the evolution of the species, united with the training of the individual, who by means of it, however, is no more enabled to bring about a consciousness of consciousness, though the psychologists (verbally at least) suppose that he is, than a gymnast, by means of athletic training, is enabled to lift himself by his boot-straps, or step clear of his shadow.

* * *

It is this actual, face-to-face experience that constitutes immediate knowledge (consciousness), whether in a particle, in man, or in whatever beings superior to

man the cosmos may hold. The universe is a unit, governed by unitary laws, and the highest being in it is as incapable of self-consciousness as the smallest particle. In this world of unknown possibilities, but of known law, a contradiction is the one thing that we are warranted in pronouncing impossible, unconditionally and forever.

* * *

The view of self as anything else than the psychological self, developed from the unity inherent in the nature of an organism, seems on the point of being abandoned by psychologists themselves. So stanch an idealist as the author of the article on Psychology in the ninth edition of the *Encyclopædia Britannica*, having admitted that "voluntary and non-voluntary attention are fundamentally the same," expressly leaves to the self "only the one power of variously distributing that attention upon which the intensity of the presentation in part depends." This admission appears significant; for, if "voluntary and non-voluntary attention are fundamentally the same," the former is resolvable into the latter, and explained by it, rendering unnecessary, and hence unphilosophical, the assumption of a special entity to explain it. The hypothesis of the self as a conscious subject, distinct from the phenomena of which it forms the center, is thus logically surrendered. It was logically vanquished long ago.

III.

Consider the act of thinking. What is it? The cat lying on the manuscript before me, for example, excites in my brain the common trace left there, and in the ancestral brain, by all the received impressions of cats. This is a perception of the cat: it is a thought,—the realisation of the concept or idea of a class in an individual object of the class. If now the perception of the cat for any reason excite in my brain the common trace of all impressions, of whatever objects, received by me, and by my ancestors to the remotest ancestral form, I realise through an individual of the most general class the concept of self, as the symbol of the common property of that class; which is the perception of the cat rounded out on a higher plane. In the first instance, the thought consists in the idea of a cat, as excited by the individual cat, and is called objective, attention being focused (consciousness concentrated) on the individual cat or object; in the second instance, the thought consists in the concept of self, as excited by the idea of a cat, excited in turn by the individual cat, and is called subjective, attention being focused on the self or subject. An organism receives certain associated impressions (percept); which excite in it the common trace of like impressions received by the individual and its ancestors (concept of the object); which, again, excites the common trace of all impressions, like and unlike, received in like manner (concept of the subject). Here, as I conceive, is the outline of mind,—perception, generalisation, personality; and no immateriality,—no self-consciousness: nothing but consciousness, in terms of interaction, comprehended in the organism that interaction has generated.

The concept or idea, in the view I take, is the symbol of the general trait of a class of objects, revived by the action of one or more individuals of the class on the general trace registered by the whole; and which itself revives the symbol of the most general trait of all objects whatever, by acting on the most general trace which they have registered,—that is, the trace of their common relation to the organism. These symbols are not psychical, in the sense of being hyperphysical. The nervous trace or register of psychical states has no psychical counterpart in that sense, but of itself, when excited, revives the more recent or intense of the psychical states that have wrought it, and which themselves, like all other states designated psychical, are in reality special modes of material nature,—physiological states, integrated and transformed in the highest co-ordinating center of the organism. In consciousness the object has no counterpart, except the subject, whose interaction with the object it is that constitutes consciousness,—distinguished conveniently as psychical, but which, as the product of physical factors, is itself physical, distinguishable from its factors in form only.

IV.

Relations in the environment set up in an organism (arising itself from secular interactions) corresponding relations, either term of any one of which, according to physical laws, revives the relation, and with it, more or less vividly, the group of relations to which it belongs, and which it thus symbolises or represents, exhibiting therein the first lines of the division of general awareness that we distinguish as mind. In short, the fact of purely physical association is the immediate source of symbolism in its whole import; which import is less intelligible in man than in the amœba, the orchid, or the crystal, only because it is more extensive, more various, more complex, more independent of direct impressions, more remote in general from the elementary state, but which in all is at bottom qualitatively the same.

* * *

The progressive integration of molecules with like molecules to the exclusion of unlike ones, in a solution of several salts, has the same kind of meaning,—is in all essential respects the same operation,—as the progressive integration of impressions with like impressions, to the exclusion of unlike ones, in the nervous masses: crystallisation and generalisation are but different exemplifications of the same process. In crystallisation, unlike generalisation, it may be said, there is no recognition of the likeness of the integrating units. How is that? Under a physical law, the necessary condition of admission into the forming crystal is likeness. The integration of the units, therefore, is itself a recognition of the likeness. Integration and recognition are two aspects of one act. Actions speak not only louder than words, but before words exist.

* * *

The paper-weight that I hold in my hand I am compelled to think as one with my consciousness of it, in the ultimate analysis of both. I am conscious, it will be

admitted, that the energy which I exert in lifting the paper-weight, and the resistance of the paper-weight, are equal; but the relation of equality presupposes the relation of likeness in kind. Hence, I cannot be conscious that two things are equal without being under the necessity of granting that they are connatural,—not necessarily the same in form or mode, observe, but the same in nature. Nor does this necessity, if accepted, lead to inadmissible consequences, as Mr. Herbert Spencer thinks. Mr. Spencer herein appears to overlook the true meaning of form as distinguished from matter. A paper-weight and my consciousness of it are immensely different in form, yet I am bound by an absolute necessity to believe that they are the same in matter. If, indeed, a simple proposition which I am compelled to accept is not true, what is true? Not certainly my own nature which in this case would compel me to accept a lie.

* * *

The state of consciousness is simply a transformation of the resistance of the paper-weight, differing from it, relatively, in the same manner that one allotrope of an element differs from another, or one isomer differs from another. As terpene, for instance, is the common substance of the essential oil of lemon and the essential oil of orange, or as carbon is the common element of charcoal and the diamond, so is mechanical force, in a sense more recondite (revealed by a deeper analysis), the common substance or the common element of the paperweight and the state of consciousness. The two forms of the force are different, the force itself, and the quality of the force, are the same in each; and we are disabled from thinking of the force as subjectively and objectively different, it seems to me, not in the first instance, as Mr. Spencer assumes, because the conception of mechanical force is the most general of our conceptions,—for, manifestly, if it were not real, the mere generality of it would offer no barrier to thought—but first of all because our cognition of mechanical force is not a conception, but an intuition—an immediate cognition—a simple consciousness—which necessitates the identity of the object in consciousness and the object in existence; for the activity of the object and the counter-activity of the subject, wherein the cognition consists, are axiomatically equal. Besides, were the object in consciousness and the outer object not the same, the cognition, in lieu of immediate, would be mediate, inasmuch as the former object, not being the object of consciousness (that which by interacting with the subject makes consciousness), would have to be the subject interacting with itself, or, what is equally inadmissible, a representative of the object without the credentials of interaction, and the possibility of immediate cognition would disappear: the condition supposed would subvert consciousness.

* * *

The disability [to think of mechanical force as subjectively and objectively different] which Mr. Spencer undertakes to explain away is coeval with thought. It is not secondary, but primary—not a product of experience in the ordinary sense of the expression, but the subjective obverse or reverse of an objective impossibil-

ity. It has been generated in us by the absolute uniformity of our experience, superadded to that of the experiences of ancestral forms running back to the simplest of these, being the register of a uniformity in external nature, uniformly repeated by millions of generations. The limitation is organic, existing in the first cognition of the developed organism, in as full vigor as in the millionth or decillionth. That a thing is itself and not anything else is a truth which, once distinctly cognised, can receive no confirmation from repetition, though the repetition were infinite. We realise our inability to conceive the negation of it, not after scaling a towering hierarchy of abstractions, but with our first step on *terra firma*.

* * *

The human mind is organised and evolved responsiveness—a comprehensive reflex of the outer forces and relations that have moulded it. Fundamentally, all psychic action is reflex action, no matter how multiplied or how complicated—Shakespeare's intellection no less than a rhizopod's feeding; and reflex action is mechanical action. The impression of a rose, received by the senses, modified and transmitted by the nervous centers, and discharged in plucking the rose, undergoes the same general change as the impulse of a breeze, received by the vanes of a windmill, modified and transmitted by the axes, wheels, and other gearing, and discharged in lifting a bucket of water; or as the pressure of the mainspring of a watch, received by the barrel, modified and transmitted by the wheelwork, escapement, and balance, and discharged in pointing out the time of day. The mechanism, whereby the force is transformed and carried from the point of application to the working point, is relatively simple in the last two cases, and surpassingly complex in the first case, but in all the cases equally the operation is mechanical—the enormous difference in degree may obscure but cannot alter the identity in kind.

* * *

The intelligence of man, the selection of plants, the motion of inanimate things (so-called), are all to my view fundamentally the same: the first may be resolved into the last, the last (granting suitable conditions) involved to the first. An apple on the tree, pulled by gravity, held by cohesion, and falling or sticking as one form of energy or the other prove the stronger, is (not in the eye of fancy but in philosophical soberness) a type of human conduct in its utmost reach and diversity—exhibits in a rudimentary form what in man is called perception, reason, will. With respect to the quality known as psychical, the sole difference between Newton, and the apple that he watched in the garden at Woolsthorpe, is a difference of degree. At no point in the vast scale can one say, "Here the physical falls short, and the hyperphysical completes the evolution." Philosophically, the entire system of things is for man, I doubt not, a question of physics. As the profoundest demonstration in mathematics may be resolved into steps so short and easy that a child can take any of them, so those steps, I am convinced, may be resolved into reflex actions, which in turn may be resolved themselves into simple reaction.

Although the development of mind from what we distinguish as matter is hard to realise in the existing stage of human experience, the thing we call matter is a fact, and a fact, moreover, to whose capabilities no limit is assignable; whereas, the immaterial entity or nonentity, invoked to supplement the alleged incapacities of matter, is not only not a fact, but infinitely the reverse, admitting of neither comprehension, nor apprehension; it is a mere creature of ontology,—of metaphysics twice removed beyond the bounds of sense. The choice, then, lies between a fact of illimitable capabilities, and a figment incapable of representation in thought.

* * *

Mechanical force, or the reality which we know under that inadequate and deceptive name, is something; that which is not mechanical force, or cannot be reduced to some sensible form of it, actually or ideally, is nothing. Mechanical force, as I here said, is not simple matter. Nor is it simple motion. It is matter in motion—energy—the only state in which either matter or motion can be directly cognised by man. Matter is the body of energy, motion the soul. Energy is existence.

* * *

No effort of consciousness enables us to assimilate consciousness and motion, it is said. True; for to assimilate consciousness, and motion in some other form, would be to make consciousness conscious of itself, as well as of the antecedent motion, since the consciousness of a relation implies a consciousness of both terms of the relation. When one thinks he is representing in consciousness a unit of consciousness, side by side with a unit of motion or anything else, he deludes himself. He is conscious of only one term of the fancied comparison; to be conscious of the other term—a unit of consciousness—he would need the standing-place that Archimedes postulated as the condition of prizing the earth from its orbit.

v.

If we would avoid the radical contradiction of psychology, modern and ancient, I can see no stopping-place short of the conclusion that the processes of the brain which we call mental, save consciousness only, are strictly not mental at all. On the contrary, they seem to stand outside of the central consciousness, albeit structurally correlated with it, and ready functionally to enter it under the requisite stimulus. They might be called sub-conscious, as belonging to the separate consciousness of sub-centers of the brain, but not as belonging to the distinctive consciousness of man, except when they actually enter into its sphere from without, like other external objects. Sub-consciousness, in any other sense, has to me no meaning. If the word is to be used without impropriety, it can mean only unconsciousness. Provided an object is out of consciousness at all, it matters not, so far as outness is concerned, whether it is under or above consciousness—whether it is stationed at the door, or stands so remote that it may never reach the threshold.

The human organism, like every other organism, below or above it in the scale of being, may be regarded as consisting of interdependent organisms or systems of organisms, each with its own center of consciousness, subservient to that of the organism or system of organisms next above it, with which as subject it interacts as object, but of which it is not otherwise a subconsciousness. When we speak of being subconscious of this thing or that, we in fact are conscious of it vaguely or dimly, not unconscious of it. To say that we are conscious in any manner or measure of what is below the threshold of consciousness is an arrant contradiction. Feeling, for instance, to return, is one of the great parts in the trichotomy of mind to which Kant set the seal of authority, and some psychologists maintain that the other forms of consciousness, in that famous division, are developed from feeling. Psychologists agree, however, that there can be no feeling without consciousness, and also that what some of them call the correlative of feeling is physiological. What is this but saying that feeling is the consciousness of this physiological correlative? Every psychical state has a physical factor or so-called object. If, as all admit, a feeling is a state of consciousness, what is the object or objective element of the consciousness? A pleasure or pain is undeniably a psychical state. What is its physical factor or object? Not the feeling itself, for that is psychical, to say nothing of the impossibility of being its own object. What then? What but that which psycho-physiologists call the physiological correlative of feeling? In my judgment, we are bound to identify feeling with cognition, under penalty of contradiction. When I smell a rose, the odor stimulates my olfactory center, and the consequent pleasure I experience consists in the consciousness of this stimulation, just as the perception of red consists in the consciousness of the corresponding stimulation of the optic center. Pleasure and pain, with all intermediate feelings, consist as exclusively in the consciousness of their several objects or physiological counterparts as acknowledged cognitions do. A pleasure or pain is the consciousness of its object, be that object localised or unlocalised, as the perception of a tree is the consciousness of its object; and the object of the one consciousness is no more or less subjective than the object of the other. Psychologically, the only difference between the feeling and the perception is the difference between the objects (physiological correlatives) of the two states or acts of consciousness, the object of the feeling being one mode of the nervous system, the object of the perception another mode; the feeling and the perception alike are cognitions. And what in this respect is true of feeling is equally true of cognition, which is but a mode of feeling, the will being at most the resultant of a complex of feelings. There remains only cognition; to which, on a just analysis, all the mental phenomena, I am persuaded, will be found reducible. Mind is a special form of energy, and, on the energy of mind passing into another form, the mental form does not pass with it—the energy alone passes; wherefore, in that other form the energy is not mind, any more than heat is light, though it may readily pass back into mind, as the energy of either of these may pass into the other. In fine, mind is the functioning of

the organism as an organism. When the organism is not thus functioning, the mind is not actual, but simply possible; it exists not *in actu* but *in posse*. It may revive in greater or less degree the next instant, or it may never revive in any degree; but, which ever occurs, the mind in the interval or the stretch does not actually exist. It exists potentially, if at all.

VI.

The mechanism of intelligence, as might be inferred *a priori*, appears most distinctly in the lower classes of the animal kingdom, whose inner and outer relations are so few and simple as not to obscure the character of their mutual adjustment. A turbellarian worm, for example, is shadowed by an object, which it presently touches, and draws back: a visual impression is followed by a tactual impression, both of which modify the vital processes of the worm, the tactual impression modifying them in such wise that the resulting contraction takes the creature away from the obstacle. The several terms of this series—the visual impression, the tactual impression, the recession—become in the course of vermian experience indissolubly associated with each other (the laws of association confessedly govern all nerve-tissue), so that the third term appears to follow the first without the intervention of the second, motion being transmitted in regular succession instantaneously through the consolidated series, as through a recognised train of mechanism; whereby eventually the turbellarian, on feeling the shadow, recoils at once, without staying for the actual touch to make it recoil, as a man walking a railway, on seeing the coming train, gets off the track, without staying for the train to knock him off. No biologist will deny that this effect, in the case of the worm, is due to changes in processes purely physical, subject to the physical law of association; yet here, rudimentarily, is perception, representativeness, volition—the impression of a shadow; the inseparable association of that impression with the impression of the touch that follows it; the like association between the recession and the impression of the touch that precedes it, the recession, be it noted, following the shadow mediately in reality, immediately in appearance—that is, what in man we would say was the recognition of the shadow as a signal of retreat, and the consequent retreat, which the touch would have enforced if the worm had not prudently anticipated it, all of which is really true of the worm in a rudimentary sense: here in fact, clear of everything immaterial—clear of everything not mechanical—is incipient mind on the highway of evolution, already beyond the first stage, and travelling at speed. The correspondences between the turbellarian and the environment are limited in space and time, few, immediate, simple, unspecialised, co-ordinated in a low degree, loosely integrated—were it otherwise they could not exhibit the fundamental characteristics of intelligence in such clearness and distinctness; yet, develop the correspondences in these several particulars, and you pass from turbellaria to man, in the bewildering complexities of whose intelligence the simple characteristics of it seem lost.

Whatever difficulty one finds in taking the view of mind I have indicated (and to the average person the difficulty at the first blush may seem insuperable), he will do well in his suspense, if conscious of suspense, to anchor his judgment in the broad truth that the phenomena of mind, without exception, are subject to the law of causation, the negation of which is unthinkable; and, here, patiently ride at anchor, till at some new stage of experience, or some new reach of training, the fog shall lift from the sea, and the sun light up the shore. Be the night short or long, the land is there, and the morning will reveal it.

PAUL ROBERTS SHIPMAN.

EDGEWATER PARK, N. J.

SPENCER'S DEFINITION OF EVOLUTION.

It is a hazardous venture to call in question so basic a formula elaborated by such a master of the subject as the definition of evolution and dissolution laid down by Herbert Spencer. Yet as philosophy and science acknowledge no pontiff, the privilege of raising a question is at least open, and it may even be that finality is not yet reached.

Spencer's celebrated definition of evolution, although well known, may be repeated here:

"Evolution is an integration of matter and concomitant dissipation of motion; during which the matter passes from an indefinite incoherent homogeneity to a definite coherent heterogeneity; and during which the retained motion undergoes a parallel transformation."

His conception of dissolution is the converse of this,—"the absorption of motion and disintegration of matter."

To establish and illustrate his definition of evolution, Spencer utilises such cases as the evolution of a solar system from a nebula, of a living organism from its ovum, of complex civilisations from crude social states, and numerous others.

In these instances the definition applies perfectly. The evolution of a solar system from a nebula, for instance, is a typical integration of matter, with a passage from an indefinite incoherent homogeneity to a definite coherent heterogeneity. But how about the evolution of the nebula? Can the same formulæ that fit the evolution and dissolution of a solar system apply to a nebula? Apparently not; on the contrary, the two formulæ would appear to be exactly reversed.

No final theory as to the origin of nebulae has yet been formed; but if the common notion, which too has been countenanced by Spencer, that they arise from the collision of stars approximates the reality, then the evolution of a nebula consists in a dissipation of matter and an absorption of motion,—the reverse of the definition.

On the other hand, the dissolution of a nebula is brought about by the very process by which a solar system is formed from it. The transformation of the